Remarks

Drawings

The Office Action of June 1, 2007 at page 2 raises an objection to the drawings under 37 CFR 1.83 (a), as follows:

> **The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, "the pinion gear attached to said core and positioned to mesh with each bevel gear," recited in claim 4 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. It appears in the drawings that the bevel gear 26 and the pinion gear 24 does not show any meshing/teeth feature, thus how can it mesh with each other?**

Applicant respectfully submits that the drawings meet the requirements of 37 CFR 1.83 (a). The pinion gears are shown at reference numeral 24 in Figures 2 and 3, and described in the specification at e.g. page 4, lines 17 to 20 and page 5, lines 2, and 6 to 7. Bevel gear 26 is shown in Figures 2 and 3, and described in the specification at e.g. page 4, lines 29 to 31. The specification also specifically teaches that

> Each of the spools 12a, 12b is provided with an integrally moulded bevel gear 26 (in the recess) which, when the cassette 10 is assembled, faces the other of said spools 12a, 12b and meshes with the bevel pinions 24.
>
> [page 4, lines 29 to 31]

Thus, the specification offers full textual and graphical support for the language of amended claim 4, i.e. that "said differential gear unit comprises a core and at least one pinion gear attached to said core and positioned to mesh with each bevel gear."

Applicant respectfully points out that the meshing of gears will inherently be accomplished by the use of suitable teeth. Attached is a recent entry in Wikipedia, defining a gear as "a wheel with teeth around its circumference". Thus, the gears as described and recited will necessarily have teeth. The exact configuration of the teeth of these gears is a design/optimization feature of no relevance to the present

evaluation of patentability. Also attached is a definition of "bevel gear" as a gear with tooth-bearing faces; and a definition of a "pinion gear", also referring to teeth. The Examiner is respectfully requested to take Administrative Notice that gears inherently have teeth, and that the disposition of those teeth is a matter of routine optimization and design.

Specification

The Office Action of June 1, 2007 at page 2, paragraph 1 raises an objection to the specification for lacking proper headings. The specification has now been amended to insert headings into the specification. An Abstract of the Disclosure is attached hereto on a separated sheet. The Applicant submits that no new matter has been added. Support for the Abstract of the Disclosure can be found throughout the specification, and in particular in the original Abstract appearing on the cover sheet of WO 2004/031036 sent with the original filing of the present application.

Claim Objections

The Office Action at page 3 raises an objection to claim 5, as follows:

In claim 5:

Line 22, "a shaft of a bag loader" should be –the bag of the shaft loader--.

Applicant respectively traverses this objection. The specification at page 4, lines 12 to 14 discloses that

> The shaft 112 passes through the housing 14b in a cut out 16, through the central cut out 13 of spool 12b to mesh with a mating hole 22 in a core 21 of the differential gear unit 20.

The specification thus teaches that the core (that is, core 21 of differential gear unit 20, see claim 4 and Figure 2) comprises a mating hole (22) for mating with a shaft (112, see Figure 1) of the bag loader (100; also see Figure 1).

Claim 9 has also been objected to. Claim 9 is now canceled, rendering this objection moot.

Claims 6, 7, and 8 have been objected to for being in improper form because of multiple dependent claims depending on other multiple dependent claims. Claims 6 and 7 have now been amended to remove all multiple dependent claims. Claim 8 is now canceled, rendering this objection moot.

35 U.S.C. §112

The Office Action at page 4 rejects claims 4 and 5 under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This rejection has been dealt with in the amendment of the claims, by removing the term "satellite". The Applicants respectfully submit that the claims as now submitted adequately address this rejection. No new matter has been entered.

On page 4 of the Office Action, claims 1 to 5, 6, 7, 8, and 9 to 10 were rejected under §103(a) as being unpatentable over O'Neill, US Patent No. 4796412 in view of GB 2064477A.

Applicant respectively traverses this rejection.

It will be noted that GB 2064477A teaches a differential gear that is permanently attached to, and forms an integral part of, the machine. In contrast, independent apparatus Claim 1 of the present application is directed to a differential gear unit positioned between two carrier tape winding spools, the differential gear unit adapted to be, in use, ***removably*** connectable to a shaft of a bag loader whereby two carrier tapes can be wound up on said spools with equal tension. Likewise, independent method Claim 10 of the present application is directed to a method of loading a bag train on a bag loader, including the step of ***removably*** connecting a differential gear unit to a shaft of said bag loader. To be sure, O'Neill shows the spools can be removably connected to the bag loader, but not the differential drive mechanism.

Also, in GB 2064477A, in order to attach bags, two spools must be attached to two separate shafts of the bag loader. Likewise, the two spools 8 and 9 of O'Neill must be attached to two separate drive dogs 11 and 12 respectively of the drive unit 13. In the present invention, only one component needs to be fitted onto a single shaft of the bag loader.

With respect to dependent claims 2 to 7, applicant relies on the above comments.

Additionally, with respect to claim 2, the Office Action does not identify, in either reference, an apparatus as recited in claim 1, wherein said spools each have a recess in a surface which faces the other spool and wherein said differential gear unit is positioned in said recesses.

Applicant respectfully submits that the claims as presented are novel and unobviousness over the art of record. Applicant respectfully asks for allowance of the claims now presented.

If any fees are deemed due, please charge same to Deposit Account No. 07-1765.

Respectfully submitted,

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DATE

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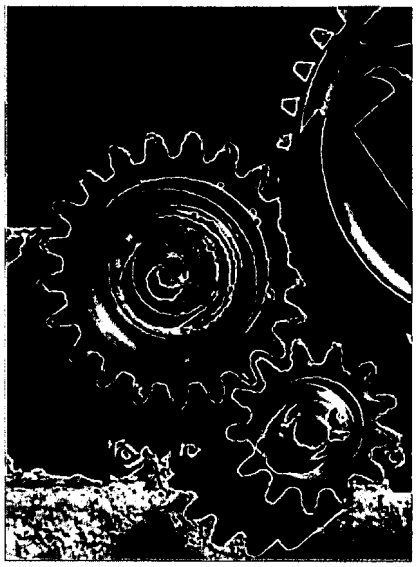
Gear

From Wikipedia, the free encyclopedia



Spur gears found on a piece of farm equipment

A **gear** is a wheel with teeth around its circumference, the purpose of the teeth being to mesh with similar teeth on another mechanical device -- possibly another gear wheel -- so that force can be transmitted between the two devices in a direction tangential to their surfaces. A non-toothed wheel can transmit some tangential force but will slip if the force is large; teeth prevent slippage and allow the transmission of large forces.

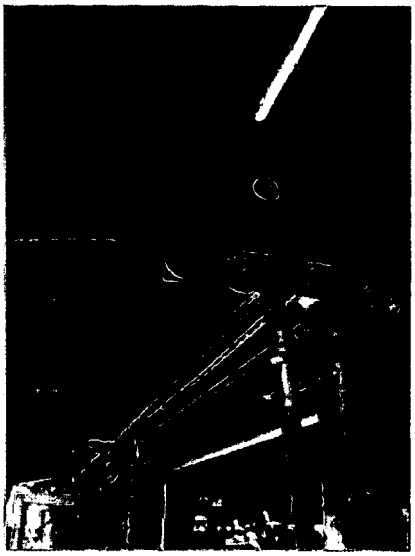
A gear can mesh with any device having teeth compatible with the gear's teeth. Such devices include racks and other non-rotating devices; however, the most common situation is for a gear to be in mesh with another gear. In this case rotation of one of the gears necessarily causes the other gear to rotate. In this way, rotational motion can be transferred from one location to another (that is, from one shaft to another). While gears are sometimes used simply for this reason -- to transmit rotation to another shaft -- perhaps their most important feature is that, if the gears are of unequal sizes (diameters), a mechanical advantage is also achieved, so that the rotational speed, and torque (rotational force), of the second gear are different from that of the first. In this way, gears provide a means of increasing or decreasing a rotational speed, or a torque. This is a highly useful property.

Contents

Bevel gear

From Wikipedia, the free encyclopedia

Bevel gears are gears where the axes of the two shafts intersect and the tooth-bearing faces of the gears themselves are conically shaped. Bevel gears are most often mounted on shafts that are 90 degrees apart, but can be designed to work at other angles as well. The pitch surface of bevel gears is a cone.



Bevel gear on roller shutter door.

Contents

Bevel gear lifts floodgate by means of central screw.

Introduction

An important concept in gearing is the **pitch surface**. In every pair of meshing gears, each gear has a pitch surface. The pitch surfaces are the surfaces of imaginary smooth (toothless) bodies that would produce the same gearing relationship by frictional contact between their faces as the actual gears do by their tooth-to-tooth contact. They are a sort of "average" surface that one would get by evening out the peaks and valleys of the individual teeth. For an ordinary gear the pitch surface is a cylinder. For a bevel gear the pitch surface is a cone. The pitch cones of meshed bevel gears are coaxial with the gear shafts; and the apexes of the two cones are at the point of intersection of the shaft axes. The *pitch angle* is the angle between the face of the cone and the axis. The most familiar kinds of bevel gears, such as those in the picture at the beginning of this article, have pitch angles of less than 90 degrees. They are "pointy". This type of bevel gear is called an *external* bevel gear because the teeth are facing outwards. It is possible to have a pitch angle greater than ninety degrees, in which case the cone, rather than forming a point, forms a sort of conical cup. The teeth are then facing inwards, and this type of gear is called an *internal* bevel gear. In the border line case, a pitch angle of exactly 90 degrees, the teeth point straight forward. In this orientation, they resemble the points on a crown, and this type of gear is called a *crown* bevel gear or crown gear.

Teeth

There are two issues regarding tooth shape. One is the cross-sectional profile of the individual tooth. The other is the line or

Gears Types > Pinion Gears

Gears - A mechanical device that transmit power and motion between axes in a wide variety of commercial and industrial applications.

Gear Applications
- Agro Industry
- Automotive Gears
- Conveyor Systems
- Instrumentation Gears
- Marine Gears
- Mill heads
- Mining Gears
- Power Station
- Wind Turbine

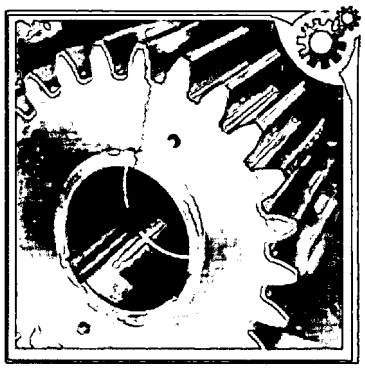
Gears Types
- Angular Bevel Gears
- Bevel Gears
- Crown Wheel
- Crown Wheel and Pinion
- Differential Gears
- Girth Gears

> MORE

Axel Positioning Gears
- Parallel Shaft Gears
- Intersecting Shaft Gears
- Neither Parallel Nor Intersecting

Gear Material
- Plastic Gears
- Steel Gears
- Cast Iron Gears
- Wood Gears
- Powdered Metal Gears

Pinion Gears



It is a small cogwheel. The teeth fit into a larger gear wheel. Rotational motion is converted into linear motion when the pinion turns and moves the rack. Pinion gears are engineered to be the best gears.

Pinion gear system involves the use of a small round gear called pinion and a large flat gear called rack, more the number of teeth in the pinion gear, more is the speed of rotation. Pinion with smaller number of teeth produces more torque. Pinion is attached to the motor shaft with glue. Rotation of pinion is done by rotation of pinion about a fixed center that helps the rack to move in the straight line. If the rack is moved and the pinion rotates then the center of the pinion moves taking along the pinion with it.

Gears Types:
Angular Bevel Gears | Bevel Gears | Crown Wheel | Crown Wheel and Pinion | Differential Gears | Fine Pitch Gears | Girth Gears | Hardened and Ground Gears | Helical Bevel Gears | Helical Gears | Herringbone Gears | Internal Gears | Mill Headers | Miter Gears | Non-Involute Gears | Pinion Gears | Rack Gears | Ring Gear and Pinion | Spiral Bevel Gears | Spur